

## ABSTRACT

A method for detecting component concentrations in human gas emissions such as breath and gas emitted from skin. A gas sample containing a specified component is collected into a gas cell using a pump and a series of valves to draw the gas sample into the cell and control the gas pressure within the cell. A tunable optical radiation beam is passed through the gas cell and the amount of energy absorbed by the specified component may be measured indirectly by taking the difference between the incident and emerging beam energy or directly by optoacoustic methods.

Concentrations of the specified component as small as 0.1 ppB may be determined.

Additionally, the tunable optical radiation beam may be multiplexed for use with a plurality of systems utilizing the beam for medical purposes.